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Effect of Digital Dependency on Academic Procrastination and Students Engagement

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Abstract

Technology has transformed the routines of students and the way that learning is experienced. While technology and learning have always been connected, keeping technologies for learning in students' possession all the time can create digital dependency which can change the way students act and learn. The focus of this study is the measurement of digital dependency and assessment of the relationship of digital dependency with academic procrastination and academic engagement of university students. Based on Self-Regulation theory, a cross sectional study with a correlational research design was conducted. In this study, digital dependency, academic procrastination, and academic engagement scales were administered to students of Abdul Wali Khan University Mardan. The digital dependency, academic procrastination, and academic engagement scaled scores were analyzed with descriptive statistics, reliability analysis, correlation analysis, and regression analysis. This study found the relationship of digital dependency and academic procrastination and academic engagement. Participants of this study showed that a high level of digital dependency was related to a high level of procrastination. This study found the relationship of digital dependency with a positive level of academic engagement. This may mean that even high levels of digital dependency, students can gain academic benefits with learning technologies. Also, digital dependency was found to affect academic engagement. This study showed that high levels of digital dependency may lead to academic procrastination and academic engagement paradoxically. Self-regulated, balanced use of technology by students is another aspect of technology integration that this study addresses. Such use serves as an important first step in the development of new research examining the dichotomy between technology used for academic vs recreational purposes and the long-term effects of digital dependence in the academic realm.

Key Words: Digital Dependency, Digital Addiction, Academic Procrastination, Academic Engagement, University Students, Self-Regulation Theory.

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Introduction

The changes brought about by technological advances in education have been both positive and negative. For students, the most significant shift has not been how education is delivered, but the expectations placed on students as a result of technological advancements. Coupled with outdoor learning and increased connectivity, students now face digital reliance both in and out of the classroom (Xue et al., 2024). Digital reliance is the excessive or unnecessary use of digital devices for communication, information, entertainment, and the execution of daily activities (Svartdal & Løkke, 2022). An increase in digital dependency will mean that students lose the ability to focus and become more distracted (Pérez-Juárez et al., 2023). One of the side effects of digital distraction is academic procrastination (Perdomo et al., 2022). Students show that behavior by intentionally putting off or ignoring tasks that have an outcome that they will later perceive to be negative (Perdomo et al., 2022). Digital interactions also impact students' persistence and participation in class (Jiang et al., 2024). The primary focus for studies should be on the connection between digital dependency, academic procrastination, and academic engagement with the phenomena of digital distraction and its impact on student engagement with academic activities.

Literature

The term digital dependency describes reliance on technological tools that perform communicative, recreational, informative, or other daily needs and tasks. Though digital dependency has only recently been studied, behavioral characteristics of digital dependency resemble those of dependency on other substances. Digital dependency can be defined by diminished self-control and an inability to stay disconnected from technology. (Cemiloglu et al., 2021) Digital dependency also describes reliance on tools such as social media, the internet, and online games, rather than dependency on a single tool. Digital technologies' capability of satisfying needs for convenience, access, and speed encourages a strong sense of digital dependency. (Karaköse et al., 2023)The Self-Regulation theory suggests individuals with less control are likely to be more distracted in the digital world, and the uses and gratification theory suggests that technology is used to fulfill rich psychological and social needs. The Cognitive-Behavioral approach explains that in the case of digital technology and necessary as well as adaptive technology and emotional difficulties and trouble, boredom can be used as a reason to use technology as a means of avoiding anxiety. The Cognitive-Behavioral theory explains a strong dependence on digital technology. All of these theories describe the harmful effects of digital dependency on behavioral and academic skills of students. (Ince et al., 2025)

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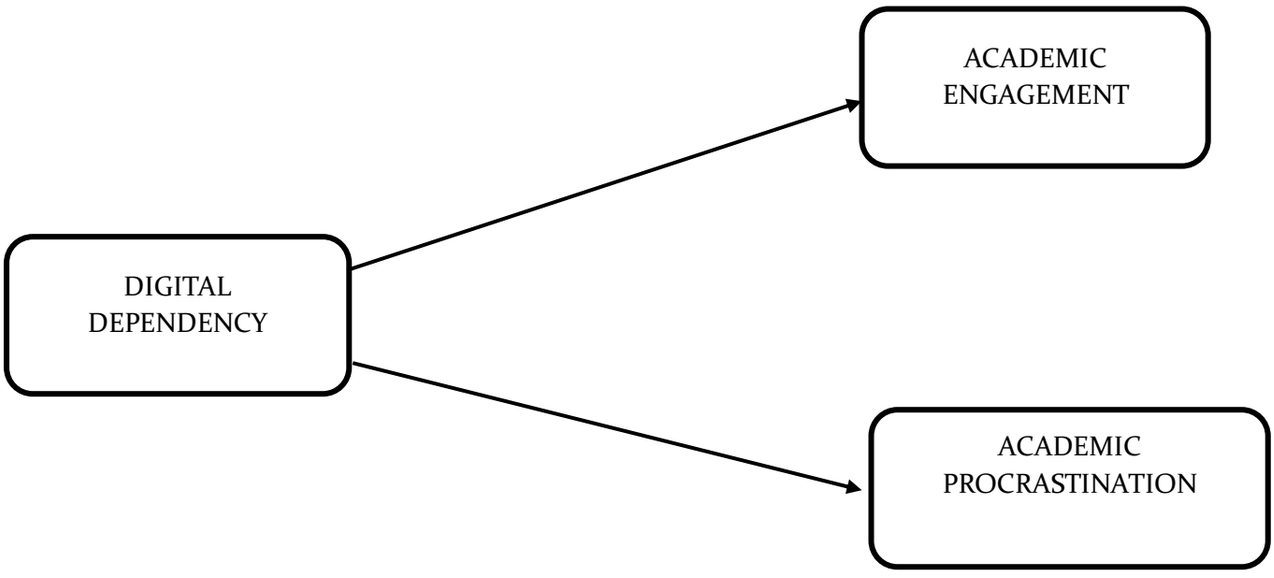
Conceptual Model



Hypothesis

- H1: Academic procrastination is positively related to digital dependency.
- H2: Digital dependency decreases academic engagement.

Research Methodology

Research Design

This study investigated the impacts of digital dependency on academic procrastination and academic engagement among students using a cross-sectional correlational research design. This design wasn't restrictive to the relationships this study aimed to investigate. The relationships among the variables of digital dependency, academic procrastination and academic engagement, were analyzed statistically.

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Sample Size

190 students from several academic faculties at Abdul Wali Khan University Mardan were selected using convenience sampling. The participants were of both genders. The participants' age was between 18 and 30.

Sampling Technique

Convenience sampling was the major participant sampling technique. Non-probability sampling was justified within the constraints of the time and resources available to collect data from a population of university students. The relevant inclusion criteria participants were willing to fulfill were either approached directly or were presented with the research questionnaires to be completed at their convenience.

Measures

Digital Addiction Scale

Digital dependency was measured using the Digital Addiction Scale, by Kesici and Tunç. The Scale was designed specifically for university students and included items relative to the use of digital technologies in a socially excessive manner, in a socially compulsory manner, and the involuntary nature of digital social behavior. The respondents to the Scale completed a 5-point Likert-type scale. Reliability and validity studies done with university students have confirmed that the scale is satisfactory. (Kesici, A., & Tunç, N. f. 2018)

Academic Procrastination Scale

The Academic Procrastination Scale (APS) was used for measuring academic procrastination. The APS was designed to capture a student's tendency for procrastinating the completion of a variety of academic tasks including the study for an upcoming examination, completion of academic assignments, and fulfillment of other academic obligations. The subjects completed the items on the APS, and subjects reported that the greater their score on the APS, the greater the procrastination. In the peer-reviewed literature, the APS has been found to have good psychometric properties when used with a student population. (McCloskey, 2011)

Academic Engagement

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In order to measure academic engagement, the Brief Self-Control Scale (BSCS) was used. BSCS was developed by Tangney et al. (2004). The BSCS is a 13-item measure of self-regulation, where the respondent is asked to complete a question on a self-report scale. The BSCS has been shown to be a valid and reliable self-control measure. (Tangney et al. 2024)

Data Collection

Data was collected after receiving permission from the concerned academic authorities, at Abdul Wali Khan University Mardan. Participants were approached, both, in person and via flyers posted in and around campus. Informed consent was obtained prior to answering the self-report survey. Participants were informed about the confidentiality of their answers and how the responses would be used for the current study only. The questionnaires included demographic data collection and a series of three scales: Digital Addiction, Academic Procrastination, and Brief Self-Control. Participants completed the questionnaires on paper. On average, participants took 15 to 20 minutes to complete the questionnaires. Once questionnaires were completed, they were used for analysis.

Ethical Considerations

During the different phases of the study, the rights of study participants were observed. Participants were not compelled to participate. Participants were free to withdraw from the study at any time. Study participants were assured of full confidentiality, and no study participant was identified in the study. Informed consent was obtained by presenting the study to the participants prior to their participation in the study. Data obtained in the study were stored securely and used only to study the impact of the proposed study and for no other purpose.

Data analysis

The Statistical Package for Social Sciences (SPSS) was used to analyze the data. Measures of central tendency and the standard deviation were calculated for both study variables and demographic variables. For the remaining variables, measures of frequency and percentage were calculated. The reliability of the three scales was assessed by computing Cronbach's alpha.

The relationship of the constructs of digital dependency, academic procrastination, and self-control was examined by Pearson Product Moment Correlation. Digital dependency was the independent variable in a Multiple Regression analysis of academic procrastination and academic engagement. p values less than or equal to .05 are statistically significant, and in this case, p = .04 was deemed statistically significant.

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RESULTS

Table 1

Demographic Characteristics of Participants (N = 190)

Variables	Category	N	%
Age	18–21 years	164	86.3
	22–25 years	26	13.7
Marital Status	Married	4	2.1
	Unmarried	186	97.9
Education	BS	176	92.6
	MPhil	13	6.8
	Other	1	0.5

Table 1 describes the demographic characteristics of the participants. The sample consists of primarily young university students, as most (n = 164, 86.3%) of the respondents were between the ages of 18 and 21, while only a small proportion (n = 26, 13.7%) were between the ages of 22 and 25. For marital status, most (n = 186, 97.9%) of the respondents were unmarried, while a small proportion (n = 4, 2.1%) were married. These findings show that the sample includes the primarily unmarried population as would be expected for most university students. For educational attainment, the majority of the respondents (n = 176, 92.6%) were enrolled in BS degree programs. A smaller number (n = 13, 6.8%) were pursuing MPhil. One participant (0.5%) was in another educational group. It can be concluded that this sample may be representing undergraduate students at Abdul Wali Khan University Mardan.The sample for the study was young, unmarried, undergraduate students, wherein the relationships among digital dependency, academic procrastination, and academic engagement can be studied.

Table 2 Correlations Among Study Variables (N = 190)

Variables	M	SD	α	1	2	3
1. Digital Addiction (DA)	3.32	0.51	.91	—	.333**	.200**

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Variables	M	SD	α	1	2	3
2. Academic Engagement (AE)	3.31	0.49	.89	.333**	—	.300**
3. Academic Procrastination (APS)	3.27	0.53	.87	.200**	.300**	—

Note. *N* = 190. M = Mean; SD = Standard Deviation; α = Cronbach's Alpha reliability coefficient. p < .01.

Table 2 presents the descriptive statistics and reliability and correlation coefficients for digital addiction, academic engagement, and academic procrastination. Participants scored moderate levels of digital addiction (M = 3.32, SD = 0.51), academic engagement (M = 3.31, SD = 0.49), and academic procrastination (M = 3.27, SD = 0.53). The study measures showed satisfactory internal consistency with reliability coefficients. The Digital Addiction Scale exhibited excellent reliability (α = .91). The Academic Engagement Scale (α = .89) and the Academic Procrastination Scale (α = .87) also showed good reliability. The correlation analysis revealed an association between digital addiction and academic engagement, r = .333, p < .01, and digital addiction was found be associated with academic procrastination, r = .200, p < .01. Academic engagement was also found to be associated with academic procrastination, r = .300, p < .01. The analysis of the relationships between study variables and the scales indicates that the study variables are associated with one another and that the scales achieve an adequate level of reliability.

Table 3 Simple Regression (N = 190)

Dependent Variable	Predictor	B	SE B	β	t	R^2	F	p
Academic Engagement (AE)	Digital Addiction (DA)	0.322	0.067	.333	4.839	.111	23.418	< .001
Academic Procrastination (APS)	Digital Addiction (DA)	0.209	0.075	.200	2.795	.040	7.814	.006

Note. N = 190. B = Unstandardized regression coefficient; SE B = Standard Error; β = Standardized regression coefficient; R^2 = Coefficient of determination.

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Interpretation

Table 3 presents results from two simple linear regression analyses to investigate the effect of digital addiction on engagement and procrastination in academics. The first regression analysis showed that digital addiction was able to account for 11.1% of the variation in engagement and was found to be a positive predictor of engagement with a positive β value of .333 and a statistical significance of $p < .001$. The t value of 4.839 and an F value of 23.418 which was significant at $p < .001$ also shows that the model was statistically significant. The positive predictor of academic procrastination, digital addiction, was able to account for 4.0% of the variation in educational procrastination with a positive β value of .200 and a statistical significance of $p = .006$. The regression model was also found to be statistically significant, $F(1, 188) = 7.814$, $p = .006$.

The analyses show that digital addiction is a predictor of both academic engagement and academic procrastination. Digital addiction was shown to be a greater predictor of academic engagement (11.1%) than of academic procrastination (4.0%).

Discussion

This study evaluated how digital dependency, academic procrastination, and academic engagement affect students at Abdul Wali Khan University Mardan. Digital dependency and academic procrastination have been reported to be positively related ($r = .200$, $p < .01$). This is supported by other studies, which argue that excessive use of digital media and problematic use of smartphones and the internet leads to a greater level of procrastination (Perdomo et al., 2022; Kutluay & Karaca, 2024). According to Crocker (2014), the use of technology leads students to expect instant rewards, and, thus, creates self-regulation problems. This contradictory finding shows that there was a positive correlation between digital dependency and academic engagement ($r = .333$, $p < .01$). It seems that students have become more reliant on digital resources for communication and instruction and for learning and teaching technologies as well as for online education frameworks. The results suggest that digital media has the potential to positively contribute to academic outcomes; however, as in most other cases in life, its potential can be positive or negative depending on whether is used in an educative or recreational way.

Implications of the Study

The findings of the study have many implications. From a theoretical standpoint, this study adds a new perspective to digital dependency and its influence on the Academic Procrastination and Engagement of university students. Moreover, this research corroborates the assumptions of Self-

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Regulation Theory, especially the relation between digital dependency and Academic Procrastination.

This research demonstrates how technology impacts self-regulation within the scope of academic behavior. This study aims to assist university staff, including administrators, counselors, and faculty. From an empirical standpoint, one of the strongest associations in this research was the positive correlation between academic procrastination and digital dependency. This association has numerous implications for university staff concerning the immediate implementation of supportive health technology interventions.

Balanced with the positive digital technology association of academic engagement, technology should be used for the goal of performing activities that are constructive and academically inclined. Self-regulation and responsible use of digital tools, along with several technology use workshops, can be offered by both university staff and counseling centers.

Conclusion

The effects of digital dependency on academic procrastination and academic engagement of students in Abdul Wali Khan University Mardan was the main subject of this study. The relationship between digital dependency, academic procrastination, and academic engagement was analyzed; and some surprising results were uncovered. First, the hypothesis stated that more digital dependency would correlate with more procrastination. This hypothesis was indeed true. The second hypothesis stated that digital dependency would correlate with academic engagement in a negative way. This was incorrect. Results showed that the more digital dependency, the more engagement with academics. Digital technology can be distracting for students, but technology can also be used as a tool and an enhancement to the educational experience. This study touches on the balance, purpose, and responsibility when university students utilize technology. This example shows both negative results of digital dependency and positive academic results of digital dependency. Using digital resources for better self-regulation can lead to more academic engagement and less digital dependency.

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